In the Specification:

Please amend the paragraph beginning on page 5, line 9, as follows:

--~~FIG. 13 is a screen capture~~FIGs. 13A-13B are screen captures showing the internal structure of the unitary structural member;--

Please amend the paragraph beginning on page 5, line 11, as follows:

--~~FIG. 14 shows~~FIGs. 14A-14B show, in solid ~~and in line~~ drawing, a digital assembly of a pair of unitary structural members;--

Please insert the following new paragraph on page 5, after line 12:

--FIG. 15 shows a line drawing of a digital assembly of a pair of unitary structural members;--

Please amend the paragraph beginning on page 5, line 13, as follows:

--~~FIG. 15 shows~~ FIGs. 16A-16C show examples of three-dimensional printing of expendable patterns for manufacturing the unitary structural member;--

Please amend the paragraph beginning on page 5, line 15, as follows:

--~~FIG. 16 shows~~FIGs. 17A-17B show a pair of pattern components in a "green" state after powder removal;--

Please amend the paragraph beginning on page 5, line 17, as follows:

--~~FIG. 17 shows~~ FIGs. 18A-18C show part patterns for producing a unitary structural member, with gating attached;--

Please amend the paragraph beginning on page 5, line 19, as follows:

--~~FIG. 18~~FIG. 19 shows a step in an investment casting process for producing unitary structural member;--

Please amend the paragraph beginning on page 5, line 21, as follows:

--~~FIG. 19 shows~~ FIGs. 20A-20B show steps in the investment process following the steps shown in ~~FIG. 18~~FIG. 19;--

Please amend the paragraph beginning on page 6, line 1, as follows:

-- ~~FIG. 20 shows~~ FIGs. 21A-21C show molds for forming a unitary structural member, drying in air;--

Please amend the paragraph beginning on page 6, line 3, as follows:

--~~FIG. 21 shows~~ FIGs. 22A-22B show steps in a metal pouring operation;--

Please amend the paragraph beginning on page 6, line 4, as follows:

--~~FIG. 22 shows~~ FIGs. 23A-23B show solidifying castings in which the metal has been poured;--

Please amend the paragraph beginning on page 6, line 5, as follows:

--~~FIG. 23 shows~~ FIGs. 24A-24B show steps in destruction of the ceramic mold shown in ~~FIG. 22~~FIGs. 23A-23B;--

Please amend the paragraph beginning on page 6, line 6, as follows:

--~~FIG. 24~~FIG. 25 shows the unitary structural member in its "as cast" state prior to removal of gating;--

Please amend the paragraph beginning on page 6, line 8 as follows:

--~~FIG. 25 shows~~ FIGs. 26A-26B show castings for the unitary structural member after removal of the portion of the gate;--

Please amend the paragraph beginning on page 6, line 10, as follows:

--~~FIG. 26 shows~~ FIGs. 27A-27C show views of the casting of ~~FIG. 25~~ FIGs. 26A-26B after removal of the remainder of the gating;--

Please amend the paragraph beginning on page 6, line 12, as follows:

--~~FIG. 27 shows~~ FIGs. 28A-28B show a grinding process for the casting of FIG. 26;--

Please amend the paragraph beginning on page 6, line 13, as follows:

--~~FIG. 28 shows~~ FIGs. 29A-29C show steps in welding together a pair of unitary structural members;--

Please amend the paragraph beginning on page 6, line 15, as follows:

--~~FIG. 29~~ FIG. 30 shows the welded pair of unitary structural members after the process shown in ~~FIG. 28~~FIGs. 29A-29C;--

Please amend the paragraph beginning on page 6, line 17, as follows:

--~~FIG. 30 shows~~ FIGs. 31A-31B show the joined unitary structural members of ~~FIG. 29~~FIG. 30 during a sandblasting process;--

Please amend the paragraph beginning on page 6, line 19, as follows:

--~~FIGs. 31A and 31B~~ FIGs. 32A-32B show radiographs of the formed unitary structural member; and--

Please amend the paragraph beginning on page 6, line 21, as follows:

--~~FIG. 32~~ FIG. 33 is a diagram showing the process for indirect additive manufacture of a unitary structural member.--

Please amend the paragraph beginning on page 26, line 18, as follows:

-- A portion of the metal unitary structural member 10 having perforated web portions 12 was designed using Pro/Engineer® parametric solid modeling software. The overall curvilinear length of this prototype is approximately two feet, and the circular area in which a cross-section of the member 10 can be inscribed ranges from approximately 5 inches in diameter to 3.5 inches in diameter, although the model can be easily parametrically modified so that these cross-sectional dimensions can vary greatly per service conditions and optimization analysis. The spline or curved trajectory of this particular member 10 lies in a plane, thereby making this tube symmetrical. The web portions 12, their perforations 30, the outer surface 14 (corrugated), and the openings at the connective structure 24 can also be parametrically modified in size and shape in order to facilitate shape and structural optimization. The connective structure 24 between what would otherwise be two 68-inch long members was incorporated into this prototype in order to evaluate and verify one possible design of such a connection. Images of the pattern component computer models are

shown in FIGs. 12 and ~~13~~13A-13C, and screen captures of digitally assembled patterns are shown in ~~FIG. 14~~FIGs. 14A-14B and FIG. 15.--

Please amend the paragraph beginning on page 27, line 13, as follows:

--As is shown in ~~FIG. 15~~FIGs. 16A-16C, expendable patterns for the prototype metal unitary structural member 10 were three-dimensionally printed on a Z Corporation Z402 3D Printer. Two of these pattern components are shown in their "green" state after powder removal in ~~FIG. 16~~FIGs. 17A-17B. Each pattern component was infiltrated with resin in order to obtain sufficient strength for handing and assembly in the foundry, as well as to facilitate further finishing of the external surfaces for aesthetic reasons.--

Please amend the paragraph beginning on page 27, line 20, as follows:

--The patterns of a component per se are referred to as the part patterns in ceramic mold casting processes. Complete patterns ready for investment feature gates, runners and other elements that have been attached to the part pattern in order to facilitate the distribution of molten metal and defect-free solidification. These features are generally made out of stock prefabricated wax components and are assembled by hand with foundry glue. These features are generally collectively referred to as the gating. The part patterns for the

prototype metal unitary structural member 10 having perforated web portions 12 are shown with their gating attached in ~~FIG. 17~~FIGs. 18A-18B.--

Please amend the paragraph beginning on page 28, line 7, as follows:

--The completed patterns were hand dipped into a variety of slurry and stucco compositions. Slurry and stucco mixtures are typically engineered for initial, intermediate, and later coats so that ceramic molds are produced with excellent cavity wall accuracy, adequate strength, and sufficient permeability. It is most preferable that the first coat be made using fine silica and bonding agents that will ensure very accurate replication of pattern surfaces and details. It is equally preferred that the ceramic shell itself be strong enough to endure handling and the forces applied during casting, but not so thick that it resists contraction forces during solidification, which can cause hot tearing. For the prototype metal unitary structural member, six coats of slurry and stucco were applied and the ceramic shells were approximately ¼ inch thick. Photographs of the investment process are shown in ~~FIGs. 18-19~~FIGs 19 and 20A-20B, and ~~FIG.20 shows~~ FIGs. 21A-21C show a pattern air drying after the initial coat of slurry and stucco.--

Please amend the paragraph beginning on page 29, line 5, as follows:

--As is normal for investment casting, the fired molds were carried from the furnace using tongs and heat resistant gloves. They were then carefully positioned on sand that had been spread on the floor. Molten aluminum was hand ladled into the molds, and they were each filled in a matter of minutes. The metal pouring operation is shown in ~~FIG. 21~~FIGs. 22A--22B.--

Please amend the paragraph beginning on page 29, line 10, as follows:

--As can be seen in ~~FIG. 22~~FIGs. 23A-23B, the solidifying castings began to fracture the ceramic molds. Most of the external shell for both castings was easily removed by hand and/or with a rubber mallet. The destruction of the ceramic molds is shown in ~~FIG. 23~~FIGs. 24A-24B. A component for the prototype is shown in its 'as cast' state prior to the removal of gating in ~~FIG. 24~~FIG. 25.--

Please amend the paragraph beginning on page 30, line 8, as follows:

--The castings for the prototype metal unitary structural member 10 having perforated web portions 12 are shown with some of their gating cut off in ~~FIG. 25~~FIGs. 26A-26B. Initial removal of the gating was done with a band saw, and this operation left about ¼

inch of each gate on the surface of the castings. Most of this was removed using belt grinding machines, and the results of this process are shown in ~~FIG. 26~~FIGs. 27A-27C. Each of the gate locations was then carefully blended using hand held grinding devices as shown in ~~FIG. 27~~FIGs. 28A-28B. Evidence of surface grinds quickly and completely disappeared after the castings were sand blasted, although this was not done until after the two parts had been welded together.--

Please amend the paragraph beginning on page 30, line 17, as follows:

--In order to be able to present the connection in this prototype in both a welded and a non-welded state, the decision was made to weld two-thirds of the circumference of the joint. The components for the prototype metal unitary structural member having perforated web portions are shown being welded together in ~~FIG. 28~~ FIGs. 29A-29C. The slight discoloration of the welded joint visible in ~~FIG. 29~~FIG. 30 (left) is the result of an immersion heat treatment.--

Please amend the paragraph beginning on page 31, line 1, as follows:

--Prior to the specified heat treatments, the prototype metal unitary structural member 10 was sand blasted to provide consistent surface texture and ensure that the gates and weld had been thoroughly blended with adjacent surfaces (i.e. it is difficult to verify

surface accuracy because of the markings created during grinding). Photographs of the welded castings during the sand blasting process are shown in ~~FIG. 30~~FIGs. 31A-31B.--

Please amend the paragraph beginning on page 32, line 8, as follows:

--Radiographs of castings that are to be evaluated per ASTM and other standards include a series of slides with three tiny but different sized holes in them. (These slides may be purchased from the American Society for Testing and Materials (ASTM).) Each slide corresponds to a specific casting wall thickness, and because most castings have more than one wall thickness, several different slides are usually required for a given radiograph. The tiny holes in each of these slides are sized relative to a specific casting wall thickness, and they serve to control the interpretation or 'reading' of a radiograph. If these holes are visible on a radiograph, then that means that voids or inclusions in the casting corresponding to the sizes of these holes would also be visible in the radiograph. Because each of these tiny holes has a different diameter or, more loosely, 'thickness', standards are specified based on the number of holes that are visible. The term 'thickness' is generally abbreviated with the letter 'T', and readability standards are therefore specified as '1-T', '2-T' and '3-T'. Most aluminum castings are required to meet 2-T standards, but many small commercial castings are only required to meet 1-T standards. The aerospace industry, NASA, and other businesses making products with stringent performance specifications typically demand 3-T certification. Two radiographs of the metal unitary structural member

having perforated web portions are shown in ~~FIGs. 31 A and B~~FIGs. 32A-32B. Both of these castings met '3-T' standards.--

Please amend the paragraph beginning on page 33, line 18, as follows:

--These processes can be considered semi-direct methods of manufacturing metal components because they initially result in skeletal or porous (approximately sixty-percent dense) products that then must be infiltrated with molten metal (typically bronze) to create fully dense parts. At present, these methods, like investment casting, result in material properties that may not be sufficient for some service conditions. However, the companies that manufacture SLS machines that can process metal powders, DTM Corporation and EOS Gmbh, are developing improved materials and processing techniques in an effort to minimize this issue. Extrudehone's ProMetal® Division, which manufactures three-dimensional printing machines specifically for processing metal powders, is also developing improved materials and processes. It is possible that the metal products of SLS and 3DP machines will eventually be able to better capture the strength to weight ratio advantages of the metal unitary structural members 10. Process diagrams for the indirect additive manufacture of metal components using SLS and 3DP are shown in ~~FIG. 32~~FIG. 33.--